

EnergySmart Update

Weatherization and Intergovernmental Program

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Efficient Lights Add to Glow of the Holidays

Strings of holiday lights brighten dreary winter days. But these festive little bulbs are no energy misers.

The large, multi-colored bulbs, popular in the mid-20th century, use anywhere from 5 to 10 watts per lamp. Place 50 of them together and you're quickly consuming up to 500 watts of electricity.

Mini-lights, which dominate the market, use around 0.5 watt per bulb, an improvement over their larger counterparts. However, it is easy to consume hundreds of watts of electricity when multiple strands are plugged together to decorate a business, home or main street. It adds up when you consider that about 124 million sets are imported into the United States each year.

An energy-efficient alternative is LED (light-emitting diode) holiday lights. These lights use 90 percent less energy than mini-lights and are designed to last 30 times longer.

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A building on the Santa Cruz campus of the University of California.

U. of California Goes Green for Its Building Standards

The University of California (UC) educates more than 200,000 students on nine campuses, with an increasing enrollment. To accommodate more students, faculty and staff, UC estimates it will expand its current 90+ million square feet of space by 2 million each year over a decade. To reduce the environmental impact of new buildings and renovation projects, the UC system is requiring that each campus adopt green building design practices along with energy efficiency and renewable energy strategies.

The policy mandates, at a minimum, that all new buildings and major renovations – with the exception of hospitals – meet the equivalent standards of the Certified level of the LEED (Leadership in Energy and Environmental Design) Green Building Rating System. The campuses are not obligated to pursue LEED certification from the U.S. Green Building Council, but they must submit the equivalent documentation to the UC Office of the President.

Laboratory buildings must also meet the Laboratories for the 21st Century (Labs21) Environmental Performance Criteria. The Department of Energy and the Environmental Protection Agency created Labs21 to help reduce energy and water consumption in laboratories.

Additionally, all non-hospital projects must exceed the state's energy efficiency standards for buildings (Title 24) by 20 percent. Standards for

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U.S. Department of Energy
Energy Efficiency
and Renewable Energy

Bringing you a prosperous future where energy
 is clean, abundant, reliable, and affordable

Virginia County Straightens Out Its Utility Bills

Before Henrico County, VA, hired Jerry Walker to fill its energy manager position last year, there was little centralized review of energy bills. Walker saw an opportunity to save money.

He reviewed the county's 682 electricity accounts. Using an annual comparison program offered by Dominion Virginia Power, the local utility, he checked the accounts to be sure the rates were correct, that credits for curtailment were claimed and that unused meters were removed from the bills. He also reviewed 75 natural gas accounts and the process for buying oil for back-up generators and transportation.

As a result of this audit, the county changed 100 accounts to correct rates and schedules. They also eliminated 75 meters that were not being used, but for which the county was being billed a monthly meter fee of \$5.50 each. "Eventually, it adds up," says Walker.

Walker also discovered that the county had not declared the correct credits for three accounts grandfathered under a curtailment program, where the utility asks the county to use back-up generators during peak demand to reduce electricity consumption.

With these corrections, the county is saving more than \$190,000 per year.

Walker also works with the county's architects during the design phase to raise ideas and questions about energy use. "We are saving before a building gets built, by using correct utility billing rates and design concepts up front," he says.

Planning for the Future

Now, with a full-time energy manager on board, the county is planning for an efficient future. Earlier this year, the county adopted an energy management plan in response to a 15 percent increase in energy costs over the past two years. It is part of the county's goal of establishing a sustainable energy program.

Last year, the county formed a Rebuild America partnership to improve its 10 million square feet of offices, schools and other facilities through energy-smart technologies and practices. "Rebuild America has been a fabulous find for us," says Walker. He cites the value of networking with peers and exchanging lessons learned. In May, the county hosted a Rebuild America high performance



Henrico County's Sandston Library has received lighting upgrades.

school buildings seminar that drew 65 attendees.

Energy efficiency projects for FY2006 will be determined by the results of benchmarking being performed by Ameresco, a Rebuild America allied partner. The county, which has a strong bond rating, will finance the energy improvements itself in lieu of an energy savings performance contract. Energy management steering committees in each county department have already identified projects for this fiscal year and anticipate similar projects for FY2006.

The county is also incorporating energy data into the standards of learning for schools through fact sheets on



At a county water plant, five energy-efficient pumps have been installed.

energy-related topics.

And with the county being responsible for roadways, it is researching LED (light-emitting diode) traffic signals, as well as more efficient lighting for parking lots, to save taxpayers' dollars. "County government is responsible to its citizens," says Walker. "And energy conservation and cost reduction represent a big share of it."

For more information, contact Jerry Walker, C.E.M., at 804-501-5763 or email wal03@co.henrico.va.us.

Idaho Lab Launched

Rebuild Idaho is one of the sponsors of the Integrated Design Lab (IDL), a new research outfit focused on the development of high-performance buildings in Idaho and eastern Oregon.

The laboratory offers free consulting to architects, engineers and others on daylighting, electric lighting, HVAC (heating, ventilation and air conditioning) and other building elements.

Launched by the BetterBricks program of the Northwest Energy Efficiency Alliance – an organization of electric utilities, state governments and other organizations – the lab is located in Boise and associated with the University of Idaho. Support for the lab also comes from Idaho Power Co. and the state government's Energy Division.

IDL is trying to develop projects in the commercial and government sectors. It is especially interested in working with schools, hospitals and grocery stores. For example, it is working on daylighting design ideas for new schools in the Nampa and Meridian school districts and a charter school in Idaho Falls, all of them Rebuild America partnerships.

The great majority of the lab's work is with the design of new buildings, but it also provides advice on retrofits.

The genesis for IDL is the Lighting Design Lab, created by the utility Seattle City Light in Washington State. The Northwest Energy Efficiency Alliance's BetterBricks program became a backer of Lighting Design Lab and began supporting the creation of more such operations. In 2002, BetterBricks created the Daylighting Lab in Portland, OR.

Next came IDL in Idaho, unofficially working since February and officially opened Oct. 7. Kevin Van Den Wymelenberg was working at the BetterBricks Daylighting Lab-Seattle (co-located with the Lighting Design Lab) and commuting monthly to Idaho for projects before taking the job in Boise as director of IDL. He says there also are plans to create labs in Spokane, WA, and Bozeman, MT, in association with Washington State University and the University of Montana, respectively.

The close-focus regional approach – with labs spread through the states rather than in one large city – has several advantages, Van Den Wymelenberg says. It allows specialists to better serve local areas, and it encourages more local participation in energy efficiency and other environmentally friendly efforts. It also beats driving between Seattle and Boise, in Van Den Wymelenberg's case.

For more information, contact Sue Seifert of Rebuild Idaho and the Idaho Energy Division, 208-327-7973, email sseifert@idwr.state.id.us, or Kevin Van Den Wymelenberg, IDL director, 208-724-9456, email kevinv@uidaho.edu.



View From DC

by Daniel Sze

We have come a long way in 10 years. Rebuild America, launched in 1994, has gone through considerable evolution, and in fiscal year 2004 it changed some more. The public-private partnership aspect of the program has been flourishing, as has the federal-state teamwork. Large-scale projects, smaller pioneering efforts and burgeoning technical seminars were among the highlights of the latest year of work.

The numbers for fiscal 2004 are in, and they look good. Energy savings measured in dollar terms reached an annual rate of \$180 million from completed projects, up 27 percent from a year earlier. Partnerships have committed to projects that will add another \$208 million in annual savings. Overall, Rebuild America has improved approximately 800 million square feet of building space.

The prices of natural gas and oil were painfully high throughout 2004, reminding us all of the practical value of energy efficiency. Our work is not merely trendy or nice: it is important to our economic well-being.

More and more people must agree with us, because they have been signing up to benefit from our knowledge and network. Notable partnerships formed during FY2004 included Harvard, the entire University of California system and the Ohio Board of Regents. The second-largest U.S. school system, the Los Angeles Unified School District, also became a partner. And throughout small-town America we have continued to find people who want to work with us.

We now have far more business partners. During 2003-04 we signed up more than 100 new business partners, bringing the total to 172. In recognition of their incalculable contributions and their enhanced role in a close working alliance, we are now formally referring to them as Allied Partners: Business.

The importance of our business partners is especially obvious at the technology seminars that we hold at various locations around the country. The seminars greatly increased in number during 2004.

I can't say enough about the initiative and hard work of people across the country who have made the program succeed. This is not a top-down, command-and-control program. It relies on local leadership, business partners, nonprofit partners and the state energy offices. They have done a great job.

Dan Sze is National Program Manager of Rebuild America. Your comments are always welcome at danielsze@rebuild.org.

The Department of Energy (DOE) and the Environmental Protection Agency (EPA) have been working together to increase the roles of energy efficiency and renewable energy in controlling air pollution. New guidelines and pilot initiatives are making it possible for aggregated projects from Rebuild America and other programs to meet the mandates of Clean Air Act regulations.

But what is logical may not be easily quantifiable and verifiable, and it may not be large enough to make a noteworthy difference. As a result, states have not been doing such things as adding up the saved kilowatt hours of building improvements and submitting them as part of a state implementation plan (SIP) under the act.

The Ways to Do It

“We’d like to see states and communities look to aggregating energy efficiency measures across a community in a nonattainment zone to take full credit for the emission reductions in the state implementation plan,” says Jerry Kotas, a senior environmental scientist in the Denver office for EERE’s Central Region.

incorporated into implementation plans under the Clean Air Act. They explain what kinds of projects can be included and offer examples of the methodologies that can equate those projects with reduced air emissions.

Because the methodologies can be complex, DOE's National Renewable Energy Laboratory (NREL) is working with EPA to make it easier. The ideal would be a software

“It’s probably not going to be quite that simple,” Kotas says of the notion of automated calculations. “I wish it were.”

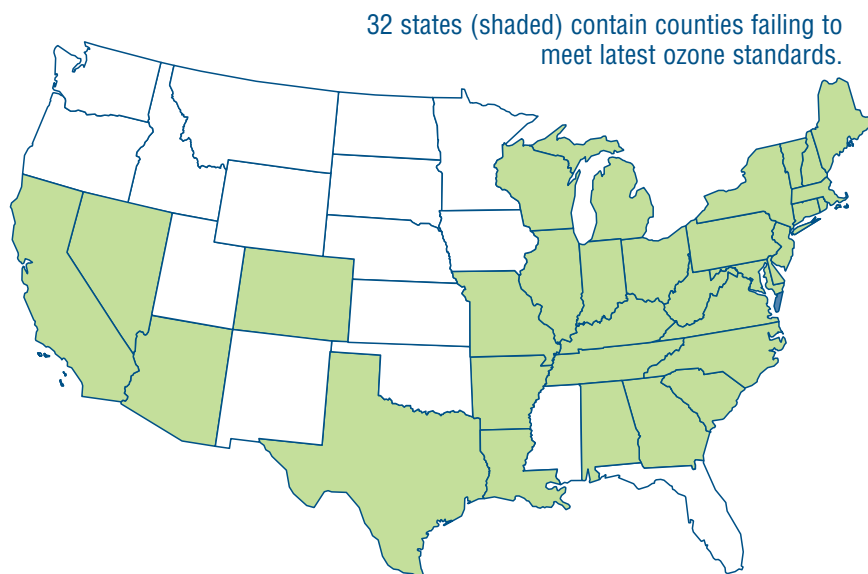
The Energy Systems

Taking the Initiative

To get things rolling, EERE and EPA went to state energy offices and asked them for pilot initiatives that can demonstrate how efficiency and renewable energy technologies and policies can satisfy Clean Air Act regulatory requirements. This autumn, four initiatives were selected. Official word on the selections had not been released as of mid-November.

The federal government is not funding the initiatives. Its role – like the usual role of Rebuild America – is to provide technical assistance, in coordination with the National Association of State Energy Officials (NASEO), a Rebuild America strategic partner, and the Environmental Council of

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University of California

hospitals will be developed in the future.

A feasibility study conducted by the UC Office of the President, campus personnel and Lawrence Berkeley National Laboratory determined that it is possible to meet the LEED Certified level without raising project costs.

To help the campuses transition to the new requirements, UC sent two administrators who developed the policy to each campus to educate personnel on green buildings from a design and financial perspective, explains Matthew St. Clair, sustainability specialist with the UC Office of the President.

As a graduate student at UC Berkeley, St. Clair and his peers in the University of California Student Sustainability Coalition (CSSC) campaigned for the policy. After its approval by the UC Board of Regents, St. Clair was hired to help coordinate the implementation of the policy. CSSC and the UC Office of the President also formed a Rebuild America partnership in September to help implement the new policy. The partnership signing ceremony in Oakland, CA, also served to recognize an ENERGY STAR®-rated building that houses the UC Office of the President.

Additional training will be provided through UC's Project Management Institute, financed by a grant from the California Public Utilities Commission for a joint energy efficiency program with the California State University system.

Some campuses already have experience with green building, notes St. Clair. UC Santa Barbara earned the system's first LEED Platinum rating (Ver. 1.0) for its Donald Bren School of Environmental Science and Management. UC Merced, the system's tenth campus (currently under construction), prides itself on incorporating energy- and water-saving features into its new buildings, each of which must achieve LEED Silver certification or higher.

Clean Energy

The policy takes an integrated approach to reducing the environmental impact of energy consumption in new buildings on campuses: energy efficiency, on-site renewable energy and clean energy purchased from the grid, explains St. Clair.

A UC clean energy feasibility study estimates that the campuses could reduce energy consumption by up to one-quarter through energy efficiency retrofits of existing buildings, offsetting a significant portion of the additional power needed for new buildings.

Producing renewable energy on-site or purchasing clean energy from the grid would further offset the effects of increased consumption of power generated from fossil fuels. UC will take a system-wide approach to purchase one-fifth of



UC Vice President for Business and Finance Joseph P. Mullinix, left, receives an ENERGY STAR plaque from the Department of Energy's Jeff James, Sept. 10.

its grid-supplied electricity from renewable sources by 2017. The plan also calls for the development of 10 megawatts of on-site renewable power generated through photovoltaic panels and other systems.

For more information on UC's green building and clean energy policy, visit http://www.ucop.edu/facil/greenbldgs/UC_green_clean.pdf or contact Matthew St. Clair at 510-287-3897 or email matthew.stclair@ucop.edu.

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Holiday Lights

A 2003 report on LED technologies for niche applications – prepared by Navigant Consulting Inc. for the U.S. Department of Energy's Building Technologies Program – estimated that “a total market shift” from mini-lights to LED holiday lights would save the nation 2 terawatt-hours of electricity annually.

LED holiday lights cost more than mini-lights. One Web site specializing in holiday lights advertised a 35-bulb strand of multicolor mini-lights for \$3.09 (\$4.40 for the “premium”), while a 35-bulb strand of multicolor LEDs cost \$9.20. The study concluded that the longevity and energy savings of LED holiday lights offsets the higher upfront costs over the lives of the strands.

The study concluded also that LED holiday lights are safer, because they operate at lower temperatures, are enclosed in epoxy plastic resin (instead of glass), and reduce the flow of power through multiple, connected extension cords.

Consumers should have an easier time finding energy-efficient decorative lights this season. Holiday Creations Inc., the nation's sole manufacturer of LED holiday lights, announced in September that its Forever Bright LED lights will be sold at more than 15,000 stores across North America, including Costco and Lowe's.

For information on LED holiday lights, visit <http://www.netl.doe.gov/ssl/publications.html> and download *Energy Savings Estimates of Light Emitting Diodes in Niche Lighting Applications*.

Remote Control for Portable Classroom HVAC

Portable classrooms are a focus of much concern because of their poor energy efficiency. In Maryland, a school system has solved at least part of the problem. The district is saving very large sums of money and keeping a better eye on comfort levels by using remote control – via internet and radioed messages – for the heating, ventilation and air conditioning (HVAC) in its portable classrooms.

Electric utilities, the U.S. military and at least one entrepreneurial company have tried remotely controlling residential air conditioning to shed load during times of high power demand. Working with suggestions from Montgomery County Public Schools, Carrier Electronics took that idea to the next step – devising software and hardware to allow remote control of HVAC in portable classrooms. Now it is paying off for the school district, a large district with almost 700 portable classrooms in the Washington suburbs of Maryland.

“Every time I check the performance of this strategy, the payback just gets better,” says the school district’s Energy Manager Ron Balon.

Based on measured data and simulations, the new system is saving the school district more than \$500,000 per year, versus an installed cost of \$350,000, Balon says. Because he is dealing with extrapolations, he is being conservative in his savings estimate. The final number for a year of savings may very well exceed \$650,000.

A Path-Breaking System

The system may be the first of its kind. Balon says he could not find any other company even claiming to do this sort of thing for portable classrooms. Rebuild America specialists have not heard of such a system being tried in another school district.

Before the new system was installed, portable classroom HVAC in the school district was controlled by teachers with a simple inexpensive mercury-bulb thermostat that had no automatic setback feature. Teachers tended not to set back the heat themselves at the end of a day, nor did they usually alter settings for air conditioning in the cooling months. Maintenance crews similarly tended not to change settings after their work was done.

The result was an average electricity cost of \$3.40 a square foot per year in the portable classrooms, that number including all lighting and other plug loads, not just HVAC. The average portable was 800 square feet, bringing the electricity cost for approximately 700 portables to about \$1.9 million a year. By contrast, Montgomery County schools were paying \$1.10 a square foot per year for electricity in normal classrooms.



Energy Manager Ron Balon with a test unit for HVAC controls.

To reduce the economic burden of the portable classrooms, Balon worked with Carrier Electronics, a division of HVAC company Carrier Corp. The new system allows Balon to send from his computer a message that travels via SkyTel messaging system – essentially a paging network – to each portable. Each of the classrooms has a thermostat and separate communications panel with a small antenna, plus wiring from the panel that goes through the wall to the packaged air-conditioning unit outside. Carrier charges a small monthly fee of roughly \$1.25 per thermostat, which includes the SkyTel cost element.

Balon programs heating for 70 degrees Fahrenheit starting at 5 a.m., easing back to 68 degrees at 8 a.m. – because peak electric rates start, and occupants are unlikely to notice the slight drop – stepping down to 64 degrees during 4-6 p.m. when teachers may be working late, then dropping back to 50 for the night. During cooling season, Balon sets the temperature at 76 degrees during primary occupied hours, 80 for 4-6 p.m. and an off-hours cap of 90.

Flexibility for Savings

A single broadcast message can reschedule the system. During holidays, school breaks, emergency closings and the six-week summer break, the portables can be quickly and remotely rescheduled to full setback 24/7, which saves about \$4,000 a day systemwide.

Another big advantage is the mobility of the system, requiring no rewiring or reprogramming when a portable is moved. Each thermostat also sends status reports back to Balon, allowing him to spot problems requiring maintenance. A broadcast test typically reveals 30 to 40 HVAC units malfunctioning at the start of each heating or cooling season.

The school district’s electricity expenses for portable

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Heat Studied in Hawaii's Portable Classrooms

There are more than 1,700 portable classrooms in Hawaii, some dating back to the 1960s. Although some newer units are insulated and air conditioned, many share a problem with the older models: uncomfortable indoor air temperatures.

"We'd heard anecdotal evidence and news reports that the classrooms were too hot and uncomfortable," says Steve Meder, assistant professor with the University of Hawaii's (UH) School of Architecture.

To investigate these concerns, the UH School of Architecture used a State Energy Program/Rebuild America Special Projects grant to study conditions in portable classrooms used by public schools in the state.

The study focused primarily on measuring both indoor and outside temperatures using data loggers at three K-12 campuses. Light levels and air movement were recorded as well. The portable classrooms varied from wood construction to concrete, some with insulation. The data loggers measured temperatures around 100 degrees Fahrenheit near the ceiling and up to 89 at desk level in some locations. According to the study's authors, "the conditions that these students are enduring are conditions that most adults would not tolerate in their workplace."

The study's results prompted meetings with the Hawaii Department of Education, Department of Accounting and General Services and state energy office. Presentations were given at Rebuild America peer forums in Santa Monica and Phoenix.

After the initial study was completed, UH School of Architecture and its students teamed up with Hawaiian Electric Co. and the American Institute of Architects' Honolulu Chapter to develop better designs for portable classrooms. Using a grant from Group 70 International, a local architecture firm's charitable foundation, the team developed the following recommendations that should be used in concert:

- Minimize solar radiation by using double roofs, reflective roofs and paints, and reduce conductive heat gain by using insulation
- Increase natural ventilation by orienting buildings to take advantage of predictable, natural breezes
- Minimize internal heat gain by using more efficient lighting and daylighting strategies

Using window air conditioning units is discouraged because it is not a cost-effective solution in Hawaii's portable classrooms, which tend to have leaky building envelopes. The design recommendations concluded that window air conditioning units should only be used when other strategies

cannot keep temperatures in a comfortable range. If air conditioning units are installed, each should be controlled by a dedicated thermostat. Teachers and other staff should be trained to properly operate the controls to maximize efficiency.

The study also highlighted a design challenge for portable classrooms: some teachers close windows to minimize distractions, while students close them so their schoolmates will not see them taking special education courses. These preferences need to be taken into account when designing new portable classrooms.

The researchers concluded that retrofitting existing portable classrooms is not cost-effective. Instead, the design recommendations should be applied to new, replacement portable classrooms. "We're not against the idea of portable classrooms, just the thoughtless design and site orientations," explains Meder.

For more information on the Hawaii portable classrooms study, contact Steven Meder at smeder@hawaii.edu.

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Portable Classroom HVAC



McChell Jackson coordinated installation work at portable classrooms.

classrooms now are about \$2.20 a square foot per year, a big drop from the earlier \$3.40.

Teachers are allowed to override settings for two hours at a stretch, after which the temperature reverts to the programmed setting. That is an important factor for winning teacher

acceptance of new control systems. Balon adds that when teachers do override, they appear to be more likely to do so in a way that saves energy rather than wasting it, possibly because of the energy awareness and education efforts of Montgomery County Public Schools, which is a Rebuild America community partnership.

For more information, contact Karen D. Anderson, 301-279-3475, email Karen_D_Anderson@mcpsmd.org, or Anja S. Caldwell, same phone number, email Anja_S_Caldwell@mcpsmd.org. Or contact Rebuild America program coordinator Charles Young, 252-459-6822, email charlesyoung@aspensys.com.

Maryland District Focuses on Green Schools

Montgomery County Public Schools in Maryland is a system unwilling to merely dabble in energy efficiency. Its approach is ambitious and growing as it pursues multiple paths to efficiency.

The system has 191 schools and more to be built as the county's population grows on the sprawling northwestern side of the Washington metropolitan area. The system's Green Schools Focus program includes education, operational changes, retrofits for existing buildings, increasingly strong standards for new construction and pressure for reductions in electricity consumption.

"This is a very aggressive district. They're extremely concerned not just about energy costs but about being as efficient as possible," says Karen D. Anderson, one of the two managers of the Green Schools Focus program. She also works with the Alliance to Save Energy, a Rebuild America allied partner. Anja S. Caldwell, a LEED (Leadership in Energy and Environmental Design) accredited architect, is the other manager of the program.

The program reflects a well-rounded conservation ethic, with parts of it functioning since 1992.

Cutting Consumption

The School Eco Response Team (SERT) program promotes energy efficiency in all of the system's schools, primarily through behavioral changes. Under SERT, all schools have been given a goal of a 5 percent reduction in electricity consumption from the 2002-03 base year. If a school cuts its electricity consumption 10 percent, it can receive a rebate of as much as \$2,500. Thirty-one schools qualified for the rebates during the last school year. Next year the baseline will be moved and the savings target lowered.

"When we have more confidence, we'll set targets for natural gas and even water," Anderson says.

For middle and high schools, the district launched a Green Schools program at the start of 2003. The program is modeled on the Green Schools Program of the Alliance to Save Energy, a Rebuild America allied partner. It is limited to upper schools partly because of the more technical nature of the educational materials and the involvement of students in proposing improvements to buildings. The program rebates back to a school 40 percent of the value of avoided energy costs, up to a maximum of \$5,000. It is limited to a growth rate of 10 additional schools a year to keep its demands manageable.

Montgomery County Public Schools also posts energy consumption data on the internet to show occupants what is going on – including what they are accomplishing with their



Students at Poolesville, MD, high school test computer power use.

Green Schools program or neglecting to accomplish. The goal is to provide users with real-time data for all 191 schools within two years.

The school district's Energy Manager Ron Balon has overseen the school system's lighting retrofit, which has reached the point where the district's electricity demand is greater for computers than lights. Longstanding programs in energy management systems and utility contracting alone have saved the district more than \$50 million in the past 10 years.

New School Standards

For new construction, the school system's Green Building program is focused on LEED guidelines, promulgated by the U.S. Green Building Council. The district's goal for its next new elementary school is a LEED Silver certification.

The school system in 2003 conducted a two-day design charrette to explore the question of just how green its new schools could be. Architects and experts such as Larry Schoff – Rebuild America's EnergySmart Schools sector technical analyst – met with school district directors of planning, construction, maintenance, food service and other sectors. "That was a fascinating and chaotic process," says Anderson.

In 2003, Montgomery County Public Schools became a Rebuild America community partnership as a way to increase its access to energy experts and to learn about more projects and technologies.

For more information, contact Karen D. Anderson, 301-279-3475, email Karen_D_Anderson@mcpsmd, or Anja S. Caldwell, same phone number, email Anja_S_Caldwell@mcpsmd. Or contact Rebuild America program coordinator Charles Young, 252-459-6822, email charlesyoung@aspensys.com.

Newfound Efficiency in Rural Michigan

In Delta County, on the Upper Peninsula of Michigan, a community college and a local energy management company teamed up to improve the energy efficiency of government buildings.

The county's courthouse, its jail and a county office building received retrofits in 2003. Most of the changes were lighting – installation of T-8 fluorescent lamps and electronic ballasts to replace less-efficient T-12 fluorescents and magnetic ballasts. Some efficient new hot-water heaters also were installed. The funding for the improvements came from the state, but the initiative was very local, as were the subcontractors who did the retrofits.

In the Delta County town of Escanaba, Bay de Noc Community College – often called Bay College, for short – has an entrepreneurial arm. Called the Michigan Technical Education Center (M-TEC), it is one of 18 such centers at community colleges around the state. Its staff works with companies to train their employees in the technical and business skills needed to stay competitive in the global marketplace.



M-TEC is at Bay College in Escanaba, MI.

When the Michigan Public Service Commission announced the availability of money for energy efficiency projects, M-TEC teamed up with a company called energy.3 to win \$2 million from the commission to establish a revolving loan fund. Energy.3, based like the college in Escanaba, is an energy management and consulting company. It advises Bay College on campus energy technologies and consumption.

The Delta County work cost about \$50,000. That amount was provided as a seven-year loan from the \$2 million revolving fund. Savings on energy utility bills were guaranteed. Annual cost savings are estimated at \$8,000, and the repayment of the loan is coming from the savings.

The local champions have access to additional expertise through Rebuild Michigan. M-TEC at Bay College is the leading partner in a Rebuild America partnership, Rebuild Delta County. The Rebuild America network will help M-TEC get the most bang for the buck in the use of its \$2 million revolving fund.

For more information, contact Douglas Russell, Bay College, 906-786-5802 ext. 1210, email russelld@baydenoc.cc.mi.us.

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EERE – EPA Teamwork

States, which is an organization of state environmental commissioners parallel to NASEO.

Two localities saw no need to await pilot initiatives. The Dallas-Fort Worth metropolitan area, one of many polluted by ground-level ozone, has made the nation's first proposal for including an energy efficiency program in its state's SIP. And Montgomery County, MD, has made the nation's first proposal for using a renewable energy program as part of its state's SIP. EPA appears to look favorably on both plans.

To get a sense of how challenging it is to reduce emissions by way of energy efficiency, consider an example using national averages for conversions of energy consumption to pollutant emissions: A reduction of 1 ton per day of nitrogen oxide emissions (contributors to ground-level ozone) would require about 488 megawatt-hours of energy savings per day. That is the equivalent of replacing 923,000 100-watt lightbulbs with compact fluorescent lights.

And even where aggregated projects produce such energy savings, there is still the challenge of developing a convincing methodology for equating the savings with local emission reductions.

To read the two guidances issued by EPA on this subject, go to <http://www.epa.gov/ttn/oarpg/t1pgm.html> to access a set of documents. Click on *Incorporating Emerging and Voluntary Measures in a State Implementation Plan* and click on *Emission Reductions from Electric-Sector Energy Efficiency and Renewable Energy Measures: State Implementation Plan Credits*.

For more information, contact Jerry Kotas, EERE, 303-275-4850, email jerry.kotas@ee.doe.gov. An EPA specialist familiar with the subject is Art Diem, 202-343-9340, email diem.art@epa.gov.

Rebuild America Progress Calculator

Number of Partnerships:

712

Total Number of Committed or Completed Square Feet:

1,604,689,228

as of November 15, 2004

Web Site Update

Rebuild America Success Stories are case studies that provide real-world examples of effective building designs and retrofits. The Success Stories are drawn from all geographic regions and all market sectors.

In most cases, the success is measured in hard numbers – dollars saved, units of energy saved. In many cases, the success also involves the overcoming of a political or market barrier or the formalization of extraordinarily high design standards. The text explains what had to be done to achieve these numbers or break through these barriers.

Each Success Story can be printed in color on the front and back of a single sheet of paper. The goal is maximum convenience – a concise case study that can be handed to an individual, stacked up at conferences, added to an information kit or mailed to people. They were developed in response to requests from Rebuild America participants who wanted marketing tools that could, for example, be left in an office after visiting with someone. The Success Stories will prove their value if they inspire others to accomplish similar or better results.

These case studies are not in-depth explanations of technology. For that, a first step might be a visit to the Solution Center in the Rebuild America Web site.

The main stack of Success Stories can be accessed from the News page of the Web site. For sector-specific Success Stories, first go to a specific sector – state and local government; K-12 schools; colleges and universities; commercial buildings; or public and multifamily housing. Then click on the “Solution Center Resources” icon on the left, and you will be taken to a page that includes a stack of Success Stories filtered for that sector.

More than 40 Success Stories now are posted on the Web site, not counting the many archived “Close-Ups” – older case studies under a different name.

Tolleson Conference

Tolleson, AZ, plans to build two municipal buildings – a city hall and a public safety complex – that will score exceptionally high on measures of energy efficiency and other environmentally friendly elements of design. In preparation for that challenge, the city partnered with Rebuild America in September on a two-day conference, “The Greening of Tolleson: A Preview of the Nation’s Cutting-Edge Technologies.”

Posted on the Rebuild America Web site is a wealth of information – 17 technical presentations – from that conference. Go to the Business Partners page and scroll down to the stack of Seminar Proceedings, then click on the “Tolleson, AZ, Green Building Conference.”

Upcoming Events

January

- 12-13 Sustainable Green Buildings: Introduction to LEED**, presented by the Association of Energy Engineers. Online seminar; two 2-hour teleconferencing sessions. Contact Valerie Oviatt at 770-925-9633 or email valerie@aeecenter.org.
- 13 Technical Energy Analysis Workshop**, presented by Rebuild Michigan. State of Michigan Library and Historical Museum, Lansing, MI. Contact Chelsea Hasenburger at 517-373-1950 or email cmhasen@michigan.gov.
- 18 Energy Savings Performance Contracting Seminar**, presented by Rebuild Virginia. National Rural Electric Cooperative Association, Arlington, VA. Contact Annette Osso at 703-486-2966 or email osso@mindspring.com.

February

- 7-9 The International Air-Conditioning, Heating, Refrigerating Expo**, presented by ASHRAE and the Air-Conditioning and Refrigeration Institute. Orange County Convention Center, Orlando, FL. Visit www.ahrexpo.com.
- 10 Maintenance and Operations Seminar**, presented by the Collaborative for High Performance Schools. Sacramento Municipal Utility District Energy and Technology Center, Sacramento, CA. Visit www.chps.net/events/MOtraining.htm.
- 16-18 Effective Energy Management Program Development**, presented by the Association of Energy Engineers. Online seminar; three 2-hour teleconferencing sessions. Contact Valerie Oviatt at 770-925-9633 or email valerie@aeecenter.org.

Visit the Events page in the Rebuild America Web site to read about or post other events. You can also keep up on events and provide event listings through the Flash Report, with subscriptions available via the Web site's News page.

BUSINESS PARTNER

McQuay Provides Top Quality and Adaptability

McQuay International has adopted a business strategy that makes an especially good fit with the mission of Rebuild America. A supplier of heating, ventilation and air conditioning (HVAC) equipment to commercial, industrial and institutional customers, the company's products are among the most energy-efficient in the marketplace.

"McQuay is active in Rebuild America technical seminars, where we discuss how such equipment integrates with efficient HVAC systems," says Julian de Bullet, McQuay director of industrial relations. "These seminars allow us to present high-performance, sustainable designs with a focused audience. This is a win-win for all who attend."

Energy efficiency by itself can be a hard sell. The top equipment in terms of efficiency may also carry a higher initial cost, deterring buyers despite lower life-cycle costs. McQuay deals with that by offering a full range of products stressing a variety of qualities in addition to efficiency: flexibility, quietness, air quality, occupant comfort and environmental friendliness.

"We're really trying to focus on flexible products that are energy-efficient, making products that adapt to the building rather than the other way around," says Ben Schlinsog, manager of corporate communications.

Headquartered in Minneapolis, McQuay has four manufacturing facilities in the United States, several overseas and a conglomerate parent based in Malaysia. The company is not as well known as some other suppliers of HVAC equipment because it does not sell products for the single-family residence. But McQuay technology is atop, inside and below a great many commercial and government buildings. Consider two examples.

McQuay dual compressor centrifugal chillers are exceptionally efficient when operating at less than full load. Chillers spend 99 percent of their time operating under part-load conditions, the company points out. In a dual compressor centrifugal chiller, two of everything is connected to a common evaporator and condenser – a redundancy that provides 60 percent of the design cooling capacity with only one compressor running.

The common alternative may be two single compressor chillers, each with its own full complement of connecting equipment. Compared with two single compressor chillers, the dual compressor machine will achieve an energy savings of about 20 percent in most load profiles, McQuay says.



Below a building, ground and groundwater temperatures can provide a convenient source to assist cooling and heating. Homeowners are familiar with conventional heat pumps, which use the atmosphere as heat sink and heat source. Some Rebuild America projects employ geothermal heat pumps, which use the steady ground temperature perhaps six feet below the surface for heating and cooling in appropriate seasons. McQuay offers water source heat pumps for these geothermal applications.

One McQuay water source heat pump system uses ground temperature for heating and cooling, while two others use either well water or lake water for those purposes. A fourth design uses a boiler for heat and a cooling tower to expel heat into the atmosphere. In all four McQuay types, water circulates to carry heat to or from parts of the building. A large building can be subdivided into zones, each with its own unit, allowing better control.

For more information about those and other HVAC technologies, call or email McQuay International's Rebuild America contact, Julian de Bullet, 703-395-5054, email julian.debullet@mcquay.com, visit the company's entry in the Rebuild America Web site (www.rebuild.gov) or visit the company's Web site, www.mcquay.com.

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To learn more, visit www.eere.energy.gov

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Henniker School District (SAU#24), NH

Jaffrey-Rindge School District, NH

Kentucky State University, KY

Midwestern Higher Education Commission, MN

Millcreek Township School District, PA

Norwalk Public Schools, CT

Oak Ridge Public Schools, TN



U.S. Department of Energy Energy Efficiency and Renewable Energy

Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable



Rebuild America is a network of partnerships – focused on communities – that save money by saving energy.

These voluntary partnerships choose to improve the quality of life in their communities through energy efficiency. Rebuild America supports them with customized assistance backed by technical and business experts and resources.

Published bimonthly by the U.S. Department of Energy, EnergySmart Update also incorporates news of other programs within the Office of Energy Efficiency and Renewable Energy.

Newsletter contact:

Alan Kovski, 202-466-7391 or akovski@pcgpr.com.

To subscribe:

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REBUILD AMERICA

Office of Energy Efficiency
and Renewable Energy
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0121



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